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THE IMPACT OF CORRUPTION ON ECONOMIC GROWTH OF EMERGING ECONOMIES

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Biographic note

Ana Patrícia Carvalho Pinho was born on 23rd of April of 1994 in Vila Nova de Gaia, Porto. After finishing her course of Accountability and Management at Colégio Internato dos Carvalhos, in 2012, she entered at the School of Economics and Management of University of Porto (FEP), to take the degree on Management.

In 2015, while finishing her degree, she started working at JRCM – Contabilidade, Lda. She did an internship of 9 months and she is working there until now. On September of the same year, she initiated the Master on Economics and Business Administration at FEP. During the preparation of this thesis, she participated as a speaker on the 4th International Conference of Interdisciplinary Insights on Fraud and Corruption organized by the Observatory of Economics and Management of Fraud (OBEGEF).

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Abstract

Corruption is a complex phenomenon that several scholars studied in an attempt of understanding it better. It affects the economic growth both directly and indirectly, through several transmission channels.

We will study the impact of corruption on economic growth of a group of countries that was not considered before, the Saconne (2017)'s selection of 39 Emerging Economies, which represent more than the half of the world's population. Additionally, we will consider variables that are more general in order to be possible to compare the results on Emerging Economies with other countries. Although there are several studies that study the impact of corruption on economic growth, their analyses use different methods, considering different variables and countries than our study.

Using data from World Bank and considering a panel data with a sample of 4557 observations from 158 countries over the period between 1995 and 2015, we estimated the impact of corruption on economic growth.

The results suggest that corruption has a negative impact on economic growth, corroborating the majority of the extant studies and reinforcing the "sand in the wheels" theory. Additionally, the evidence gathered sustain that the impact that corruption has on Emerging Economies is similar to that of the remaining economies.

JEL codes: C23; C31; D73; O47.

Key words: Corruption; Economic Growth; Emerging Economies; OLS Regression.

Resumo

A corrupção é um fenómeno complexo que vários investigadores estudaram na tentativa de compreendê-lo melhor. É algo que afeta o crescimento económico, directa e indiretamente através the inúmeros canais de transmissão.

Apesar de existirem muitos estudos sobre o seu impacto no crescimento económico, são utilizados outros métodos, variáveis e países na sua análise. No nosso estudo, consideraremos um grupo de países que não foi considerado em investigações anteriores, que é a seleção de 39 Economias Emergente feita pela autora Saconne e que representam mais de metade da população mundial. Adicionalmente, nos nossos modelos vamos utilizar variáveis que são mais genéricas, permitindo uma maior facilidade e coerência na comparação de resultados entre as Economias Emergentes e outros países.

Através do uso de dados disponibilizados pelo Banco Mundial e considerando um painel com 4557 observações referentes a 158 países para o período compreendido entre 1995 e 2015, estimamos o impacto da corrupção no crescimento económico.

Os resultados sugerem que a corrupção tem um impacto negativo no crescimento económico, corroborando, assim, a maioria dos estudos e reforçando a teoria de "*sand in the wheels*". Adicionalmente, as evidências alcançadas sustentam que o impacto que a corrupção tem nas Economias Emergente é semelhante ao observado nas restantes economias.

Códigos JEL: C23; C31; D73; O47.

Palavras-chave: Corrupção; Crescimento Económico; Economias Emergentes; Regressões dos Mínimos Quadrados.

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Chapter 1. Introduction

The topic of corruption is widely studied by numerous scholars (*e.g.*, Huang, 2016; Li, 2016; Gutmann and Lucas, 2017; Lisciandra and Millemaci, 2017) with empirical evidence showing that, in general, corruption is counter-productive for countries' economic performance (Mauro, 1995; Rose–Ackerman, 1997; Jain, 2001; Li, 2016; Lisciandra and Millemaci, 2017). Nonetheless, among the multitude of studies that deal with this subject, some of them find no link between corruption and economic performance (e.g., Huang, 2016) and there are even a few countries where corruption seems to be beneficial for economic growth, by 'greasing the wheels' (Bangladesh, Paul, 2010 and South Korea, Huang, 2016).

In spite of being difficult to define precisely what is corruption, there is a general agreement that it is related with the gains obtained by public servants through means that are not in accordance with laws and regulations (Jain, 2001). In a more simplistic way, it is the abuse of authority by public servants in law enforcement for private benefit (Gutmann and Lucas, 2017). This indicates that corruption is fuelled by restrictive regulations. Thus, actions related with fraud, money laundering, drug exchanges and trades in the parallel economy without the intervention of a public servant cannot be considered corruption because they do not involve the use of public power (Jain, 2001).

There are a variety of ways by which corruption is likely to influence negatively the economy. Assuming that law and regulations are correct in the sense that they promote the efficient allocation of scarce resources, corruption harms the economy directly by changing the allocation of public resources and, indirectly, by changing incentives, prices, and opportunities available to workers and to entrepreneurs (Jain, 2001). The changing of incentives decreases the level of investment that is important on economic growth (Mauro, 1995; Borensztein *et al*, 1998; Mo, 2001; Jain, 2001; Cuervo-Cazurra, 2008). But corrupting can be, at least on a theoretical point of view, positive when law and regulations are not correct, that is, regulations hamper the smooth running of the economy (Bardhan, 1997; Williams and Martinez-Perez, 2016).

Although corruption is not limited to people with low incomes, it is more difficult to combat where exist "people in social distress and teetering on the edge of extreme poverty, [who] have few opportunities to resist the pressures of corruption." (Bosco, 2016, pp. 67).

To design policies to decrease the potential negative impact of corruption on well-being, it is essential to understand the extent of corruption: what causes it, the repercussions and the

potential costs that it can generate (Pelizzo *et al*, 2017). These elements can be measured objectively, by analysing activities that are more propitious to involve corruption, or subjectively, by using perception based-measures of corruption, such as the Corruption Perception Index (Pelizzo *et al*, 2017). Both methods have their limitations since, in the first case, they are expensive and based on cross-country comparisons which do not encompass the difference of meaning, traditions and culture of each country, and in the second case, they "rely on perceptions rather than objective facts" (Pelizzo *et al*, 2017, pp. 81).

The present investigation aims at analysing the impact of corruption on economic growth of emerging economies. It is important to study these countries because they represent more than half of the global population (see, Table 1, pp. 13), these economies are in general characterized by higher than average levels of perceived corruption (for EEs economies, transparency perceived index is, on average weighted by GDP, 37.4 points while for other countries it is 54,5 points, data from CPI 2016 and WB, 2016), and the analysis of this phenomenon focusing these economies is scarcer and, in general, restricted to a small group of EEs (e.g., Moghadam *et* al, 2003; Uhlenbruck *et al*, 2006; Luo and Han, 2009; Grande and Teixeira, 2012; Marthur and Singh, 2013; Chen *et al*, 2015; Birhanu *et al*, 2016; Williams and Martinez-Perez, 2016; Huang, 2016) or involving single country analysis (e.g., Karhunen and Ledyaeva, 2012; Mittal *et al*, 2012; Wu, 2014; Li, 2016). Moreover, several of the empirical studies focusing on EEs analyse the impacts of corruption but at a micro level, that is, at the level of the firms (*e.g.,* Uhlenbruck *et al.,* 2006; Luo and Han, 2009; Karhunen and Ledyaeva, 2012; Payne *et al.*, 2013; Wu, 2014; Birhanu *et al.,* 2016) or banks (*e.g.,* Chen *et al.,* 2015).

In order to undertake such endeavor, we resort to Saconne's (2017) classification of EEs, who considers 39 countries, representing 59% of the global population and 38% of global GDP (at purchasing power parities, constant 2011 international dollars, World Bank Indicators, 2016). In terms of methodology, we use panel data random effects estimation methodology for the period 1995-2016.

The present dissertation is structured as follows. Next chapter focuses on a literature review, where we present the key concepts and the main extant literature in the area. Chapter 3 details the methodology, and in Chapter 4 results are presented and discussed. Finally, in Conclusions, the main contributions and limitations of the study are put forward.

Chapter 2. Literature Review

2.1. Key concepts

2.1.1. Corruption and economic growth

Being an issue whose importance has been increasing over time, corruption can be defined as the abuse of power given by public entities for private gain (Bagashka, 2014; Gutmann and Lucas, 2017; Williams and Dupuy, 2017). In other words, it is related with actions which are not in accordance with the accepted norms and regulations and that are taken by public servants in order to satisfy their own interests rather than their employer's (Jain, 2001; Lo, 2017). The bigger the discretionary power the stronger the impulse to give in to bribery, *ceteris paribus* (Jain, 2001). According to Williams and Dupuy (2017), corruption is more likely to occur in environments where some people have too much power to take discretionary decisions and, additionally, there is no transparency about those decisions. Furthermore, it is more probable to happen when the legal and judicial systems have few or weak mechanisms to detect corruption (Jain, 2001), and it is powered by inefficient regulations (Trung and Kaizoji, 2017). When there is a weak judicial system or the bribers have a deep relationship with the values and culture of a society, the probability of corrupt servants being discovered and punished is small that increases the probability of deviations from law and regulations (Jain, 2001). In summary, corruption exists because of the co-existence of discretionary power to allocate resources, rents related with this power and a judicial system where the probability of detection of illicit acts is low (Jain, 2001).

Corruption can be seen as a typical principal-agent relationship where a third party influences the agent to commit an illicit action that is against the principal's interests, in exchange for compensation (Gutmann and Lucas, 2017). In principal-agent relationships, the principals provide some power of decision to the agents in order to take advantage of their knowledge, abilities, networks and contacts (Wang and Murnighan, 2016). However, this delegation of tasks can imply a loss of information that is important for the principal, as sometimes the interests of both parts are not aligned (Buzogány and Häsing, 2017). This asymmetry of information is worst when the control mechanisms of the agent's behaviour are few and/or inefficient (Jain, 2001). The weaker institutions are the ones where there is a higher probability of these illicit events to happen as their control mechanisms to ensure transparency, participation, accountability and integrity are in shortage (Williams and Dupuy, 2017). There are usually involved gifts or payments to public servants in exchange for favors that can benefit both parties: The agent, who receives the monetary

encouragement, and the third element, who can have more favorable conditions in the acquisition of goods belonging to the State or having more favorable conditions in a (would be) competitive market (Williams and Martinez-Perez, 2016).

Corruption can be divided into three types (Jain, 2001): (1) grand corruption, (2) bureaucratic corruption, and (3) legislative corruption. There are some differences between each type of corruption and they are related with the type of decisions, the power that is being used in excess and with the models available to explain the corruption (Jain, 2001).

Specifically, grand corruption refers to the abuse of power for personal interests practiced by politicians and officials from the highest levels (Lo, 2017). It is expected that these entities serve their country and government to fulfill the society's interests (Jain, 2001). However, because they have enough independency to decide about the application of laws and regulations, they can deviate from these objectives to satisfy their own agendas (Jain, 2001; Lo, 2017).

Bureaucratic corruption is the corruption practiced by bureaucrats, who are officials working in an organization or a government department, especially one who follows the rules of the department too strictly (Oxford Dictionary, 2010). It "refers to private payments to public officials to affect the implementation of already existing rules" (Bagashka, 2014, pp. 168). In hierarchical terms, the bureaucrats are above the population and below the political elite, which means that corruption can exist on both directions, from bureaucratic to population and from bureaucratic to political elite (Jain, 2001). It can involve, in the first case, the solicitation of higher payments to the public in order to solve some bureaucratic issues faster, known as petty corruption, or even to do requests that are not supposed to be included on the range of activities available by this kind of services and, in the second case, the payment for a favorable appointment (Jain, 2001). As mentioned before, petty corruption is related with the illicit acts practiced by officials from the lower levels who receive bribes in order to surpass procedures and conceive facilities in terms of bureaucracy (Lo, 2017).

Finally, the legislative corruption, as the own name indicates, has to do with the influence that legislators can be victims of when it comes the time to vote for the approval or disapproval of laws or regulations (Jain, 2001).

All of these relationships involve the use of discretionary power which concern the conception, interpretation and enforcement of laws and regulations. This means that is it more likely to find corruption in more regulated economies (Jain, 2001). If this is true,

then, it is expected that a reduction in regulations, *i. e.*, an increase in liberalization, leads to a decrease of the corruption level (Jain, 2001). Nevertheless, this is not so linear and it seems that liberalization is accompanied by more corruption, at least, on short-term. Even though reducing regulation passes by the reduction of government's mediation on economy that decreases the discretionary power of public agents, this process is conducted itself by the state, which means that there is an opportunity to take advantage from the changes to be done (Jain, 2001), for example, an economic agent is available to pay a bribe to be able to enter a market that was previously closed.

Corruption can also be divided between pervasive and arbitrary corruption: the first is certain and widespread, representing the known cost of corruption; the second creates higher uncertainty, as it is never clear whether you will be requested a bribe or not and if the bribe you pay will produce the expected results (Cuervo-Cazurra, 2008).

According to Cuervo-Cazurra (2016), there are two other additional ways of distinguishing corruption: organized versus disorganized corruption; corruption with theft versus corruption without theft. The first distinction is related with the fact that the corruptive actions can be more or less coordinated among the officials. Corruption is organized when there is requested only a bribe and there are no additional payments to officials whereas the disorganized implies that more than one official of government ask for a bribe in order to provide the same service (Cuervo-Cazurra, 2016). The second different is a result of the fact that sometimes even if the public pays a bribe, they also have to do the payment to the government (for example, taxes, permit fees). When there are both payments, the corruption is with theft but if there only take place the payment of the bribe, the corruption is without theft (Cuervo-Cazurra, 2016).

Even though there are several types of corruption, we will focus our investigation in a wide concept of corruption (the one that is perceived by people and condensed in the Corruption Perception Index) because it would require more time and resources to study a specific kind of corruption, regradless of the country's dimension.

The most common variable used to reflect countries' level of development is the Gross National Product (GNP) *per capita;* economic growth, encompassing the impact on people living standard, is measured by the annual relative variation of GNP *per capita* (Bosco, 2016).

2.1.2. Emerging Economies (EEs)

The concept of EEs is used to distinguish, among the less developed countries, those where growth is slow from those where growth is fast. EEs are countries with low income whose pace of economic growth is fast. Although EEs are still laggard from developed countries in terms of real product/income *per capita*, they are in the process of convergence to high levels of development (Saconne, 2017) using liberalization policies as its primordial mean of development (Hoskisson *et al.*, 2017).

Saconne (2017) proposes a two criteria for identifying/classifying an economy as EE, having as reference the last 15 years period data from World Bank: 1) the average level of GDP per capita is below the world average; and 2) the average growth rate of GDP per capita is higher than the world average. Using these criteria Saconne (2017) identifies a group of 39 economies (see Table 1).

Table 1: List of EEs, by continents

Countries	Population in 2016 (millions)*	% of World Population	GDP PPP 2016 intern $ (billions)	% World GDP
		EUROPE		
Albania	2,88	0.04%	34,31	0.03%
Armenia	2,92	0.04%	25,79	0.02%
Azerbaijan	9,76	0.13%	168,43	0.14%
Belarus	9,51	0.13%	171,70	0.14%
Bulgaria	7,13	0.10%	136,85	0.11%
Latvia	1,96	0.03%	51,03	0.04%
Lithuania	2,87	0.04%	86,07	0.07%
Montenegro	0,62	0.01%	10,50	0.01%
Poland	37,95	0.51%	1.055,35	0.88%
Romania	19,71	0.26%	465,56	0.39%
Serbia	7,06	0.09%	102,42	0.09%
Turkey	79,51	1.07%	1.927,69	1.60%
		ASIA		
Bangladesh	162,95	2.19%	583,48	0.49%
Cambodia	15,76	0.21%	58,88	0.05%
China	1.378,67	18.53%	21.417,15	17.83%
India	1.324,17	17.79%	8.702,90	7.24%
Indonesia	261,11	3.51%	3.032,09	2.52%
Kazakhstan	17,80	0.24%	449,62	0.37%
Myanmar	52,89	0.71%	305,30	0.25%
Philippines	103,32	1.39%	806,54	0.67%
Sri Lanka	21,20	0.28%	261,14	0.22%
Thailand	68,86	0.93%	1.164,93	0.97%
Turkmenistan	5,66	0.08%	95,59	0.08%
Uzbekistan	31,85	0.43%	207,47	0.17%

Vietnam	92,70	1.25%	595,52	0.50%
		AFRICA		
Angola	28,81	0.39%	187,26	0.16%
Ethiopia	102,40	1.38%	177,66	0.15%
Ghana	28,21	0.38%	121,11	0.10%
Morocco	35,28	0.47%	280,72	0.23%
Mozambique	28,83	0.39%	35,09	0.03%
Nigeria	185,99	2.50%	1.091,23	0.91%
Tanzania	55,57	0.75%	150,34	0.13%
Uganda	41,49	0.56%	76,70	0.06%
Zambia	16,59	0.22%	65,08	0.05%
		AMERICA		
Chile	17,91	0.24%	429,12	0.36%
Colombia	48,65	0.65%	688,82	0.57%
Dominican Rep.	10,65	0.14%	161,96	0.13%
Peru	31,77	0.43%	413,76	0.34%
Uruguay	3,44	0.05%	74,48	0.06%
World Total	7.442,14		120.141,76	
EE countries	4.354,42	59%	45.869,63	38%

Source: World Bank Database, in https://data.worldbank.org (access on 4/10/2017 and 1/11/2017)

These economies represent, as shown on the table above, almost 60% of the global population and 38% of the world's GDPppp (data of 2016).

During the last twenty years, many studies were conducted to understand the impact of corruption on EEs in diverse areas: firms, banks, economies and people's behavior. By revising the past, we can conclude that a greater emphasis has been given to study its consequences on companies' performance (Williams and Martinez-Perez, 2016; Payne *et al*, 2013), which factors can determine the higher or lower level of corruption behind the organizational activities (Wu, 2014; Luo and Han, 2009), and the influence of corruption on firm's strategies (Karhunen and Ledyaeva, 2012).

According to Williams and Martinez-Perez's (2016) research, there is a belief that companies can only reach high results if they bribe public servants in order to benefit in a competitive market. In other words, they concluded that in EEs the relation between corruption and firm's performance is positive, which means that an increase in the level of corruption leads to an improvement of the resourcefulness of the companies.

On the other hand, certain characteristics of a company can also influence the level of corruption that exists in it. For example, firms that include corporate social responsibility (CSR) in their strategy usually have lower levels of corruption (Wu, 2014). There are several external and internal factors that can affect the companies' behavior in the market, such as

the pressures exerted by competition and government forces (Wu, 2014), whose effects can include a higher level of illicit actions. The firms that possess institutional or competitive advantages, as expected, have lower degrees of corruption (Luo and Han, 2009). This also occurs in "firms whose ownership is partially shared by government or foreign investment" (Luo and Han, 2009, pp. 234).

Another important aspect studied is the impact of corruption in banking. Recent research suggests that higher levels of corruption are related with a higher risk acceptance by banks (Chen *et al*, 2015). One of the reasons that can explain the lower profits and its wider variation is the corruption, which has a negative effect and even larger banks can be victims of this problem (Chen *et al*, 2015).

However, in order to have a more encompassing perspective, there is a need of studying and comparing distinct economies. As mentioned before, corruption affects the levels of investment of a country, and the perceptions about corruption have the same effect. Thus, when corruption perceptions are high, the incoming levels of Foreign Direct Investment (FDI) tend to be low (Marthur and Singh, 2013). Marthur and Singh (2013) also conclude that the level of investment entering in a country can be affected by its level of democracy, specifically they found that "more democratic countries receive less inflows" (Marthur and Singh, 2013, pp. 1001). Another research, considering the countries whose official language is the Portuguese (PALOP's[1]), realized corruption is crucial to define the FDI inflows, and support the content that the countries' culture and history is not sufficient to overcome the costs of institutional weaknesses (Grande and Teixeira, 2012).

Even though there is a wide range of studies about corruption in EEs, the ones mentioned before do not cover simultaneously all the EEs, and/or are based on firm level data which requires purposely and expensive data collection.

2.2. Impact of corruption and other determinants of economic growth

GNP *per capita* growth is influenced by several determinants, most notably (see Kong and Volkema, 2016) capital intensity, both physical and human, and technological level. Economic policies, culture, human development, globalization, and institutional quality (embracing political and legal dimensions), proxied by measures such as the size of public sector, cultural traditions, human capita/education, population ageing, trade openness, and

[1]PALOP – *Países Africanos de Língua Oficial Portuguesa*, it includes Angola, Cape Verde, Guinea-Bissau, Mozambique and Sao Tome Principe (Grandre and Teixeira, 2012).

level of corruption, also influence the evolution of GNP *per capita* (Bosco, 2016; Saconne, 2017).

Bellow we detail the several ways through which corruption, and other key variables, affect economic growth (see Mo, 2001).

2.2.1. The impact of corruption on economic growth

During the last decades, several studies have debated whether the corruption "grease the wheels" or "is sand" on the economic growth (Cuervo-Cazurra, 2008). In the first, optimistic, approach, it is considered that corruption has a significant and positive effect on economic development (see Paul, 2010; Huang, 2016) as it facilitates the commercial changes in some bureaucratic aspects allowing the existence of a competitive market rather than a monopoly (Cuervo-Cazurra, 2008). The "grease the wheels" theory states that corruption helps the development of an economy when there are inefficiencies on the market created by incompetent bureaucratic and long-lasting processes that create an impediment to investment (Leys, 1965; Méon and Sekkat, 2005). There are several aspects that can be compensated by corruption in a country with an ill-functioning bureaucratic system, such as the speeding of the process of creating a firm, for example, allowing a decrease in the queue (Leys, 1965; Méon and Sekkat, 2005). By doing it, more companies can be built in a shorter period of time than if there were no bribes or the cut of red tape and, as a result, the capacity of production of a country can be increased (Leys, 1965).

The second point of view, the more widely accepted one, considers that corruption means higher uncertainty and, as a consequence, higher costs not only for the companies but also for the economy as a whole (Cuervo-Cazurra, 2008). This point of view has as support the fact that there is strong empirical evidence that links high corruption levels with smaller GDP *per capita*.

Corruption decreases GDPpc level by changing incentives and prices that causes non-efficient allocation of scarce resources. This misallocation of resources involves wrong decisions taken by the government about the destination of public funds and the acceptance of certain private investments (Jain, 2001). In order to maintain high incomes from corruption and the secrecy within a small group, the corrupt members of government can, for instance, allocate government funds in few big contracts rather than applying it for smaller contracts that would be better to population where it would be harder for the

corrupt agent to have gains (Bardhan, 1997). This happens because it is easier to control the level of corruption when the delegation of power is low (Buzogány and Häsing, 2017; Williams and Dupuy, 2017). There is also a lack of efficiency in the re-allocation of resources from firms' normal activities for more profitable illegal purposes (Mo, 2001).

Corruption might also decreases GDPpc growth by reducing investment, due to not only an increase in the risk, by introducing instability in the legal frame work (Marthur and Singh, 2013), but also a decrease in opportunities available to entrepreneurs, as they can receive less income and experience a higher level of uncertainty (Jain, 2001; Cuervo-Cazurra, 2008). As underlined by Marthur and Singh (2013, pp. 1001), "the more corrupt a country is perceived to be, the less the flows of Foreign Direct Investment (FDI) to that country" (Jain, 2001).

Empirical evidence shows that corruption does not have the same impact on economic growth in all countries or group of countries. This differences are related not only with the characteristics of each country (size, political forces, legal framework, regulations), but also with the variables used in the model that are different according with the approach of each scholar. Mauro (1995) found a significant negative relation between a corruption index and economic growth.

Table 2 summarises some recent studies (2016 and 2017) detailing the different countries or group of countries analysed, the period of time, and the variables used to measure corruption, as well as the model and the main results.

Table 2: List of empirical studies about the effect of corruption on economic growth

Author (Year)	Analysed Countries	No. of countries	Period	Variable to measure corruption	Model	Relation between corruption and economic growth
Chang and Hao (2017)	Global	87	2002-2012	Level of corruption indicators compiled by the International Country Risk Guide	$\Delta GDP_{it} = \alpha \Delta GDP_{i,t-1} + \beta_1 \Delta Environment_{it} + \beta_2 Corruption_{it} + \beta_3 (Corruption_{it})^2 + \beta_4 [Environment_{it} \times Corruption_{it}] + \beta_5' \Delta X_{it} + (\eta_t - \eta_{t-1}) + \Delta \varepsilon_{it}$	negative
Neanidis *et al* (2017)	Italy	1	1983-2009	Official number of crimes against public administration per 100,000 inhabitants reported to the police and published by the Italian National Institute of Statistics (ISTAT)	$g_i = \alpha + \beta_1 OC_{i,t} + \beta_2 Corr_{i,t} + \beta_3 (OC \times Corr)_{it} + \sum_{j=1}^{m} \gamma_j X_{j,it} + \mu_i + \varepsilon_{i,j}$	negative

Huang (2016)	Asian-Pacific	13	1997-2013	Corruption Perception Index (CPI)	Bootstrap panel Granger causality analysis	Not significant *
Li (2016)	China	1	1999-2006	Provincial corruption rate (From China Statistical Yearbook)	$Provincial\ GDPpc = \alpha + \beta Provincial\ Corrup + X_\gamma + \varepsilon$	negative
Lisciandra (2016)	Italy	1	1968-2011	Number of crimes reported to prosecution departments resulting in criminal proceedings divided by the population	$\dot{y}_{i,t} = \alpha + \rho\dot{y}_{i,t-1} + X_{i,t}\beta + u_{i,t}$	negative
Tsanana (2016)	EU enlarged	27	1995-2012	Corruption Perception Index (CPI)	$growth_{i,t} = c_1 growth_{i,t-1} + c_2 growth_{i,t-2} + \beta lny_{i,t-1} + \alpha_1 INV_{i,t} + \alpha_2 FDI_{i,t} + \alpha_3 HC + \alpha_4 INF_{i,t} + \alpha_5 GOV_{i,t} + \alpha_6 OPEN_{i,t} + \alpha_7 FDI * OPEN_{i,t} + \alpha_8 DUM08_{i,t} + \alpha_9 DCOR_{i,t} + \alpha_{10} DCOR13_{i,t} + \alpha_{11} DCOR_{i,t} * GOV_{i,t} + \alpha_{12} BUR_{i,t} + \alpha_{13} BUR13_{i,t}$	positive

*With exception of South Korea where the impact is significant positive.

Most of the studies undertook concluded that the impact of corruption on economic growth is negative, which means that more corrupt countries evidence lower GDPpc growth (Li, 2016; Lisciandra, 2016; Chang and Hao, 2017; Neanidis *et al*, 2017).

Nonetheless, there are several studies where the impact of corruption is not statistically significant (see Huang, 2016), with some few evidencing that the existence of corruption can even contribute to the economic growth ("greasing the wheels" in inefficient regulatory framework) and, goes deeper claiming that the cost incurred from measures taken by the government against the corruption and bureaucracy are not always beneficial for economic growth (Tsanana *et al*, 2016; Huang, 2016).

Chang and Hao (2017) used a set of indicators related with the level of corruption compiled by the International Country Risk Guide to measure the impact of corruption on economic growth, from 2002 until 2012. The estimations, resorting to OLS regressions, prove that corruption impacts negatively on economic growth. Neanidis *et al* (2017) concluded the same using the official number of crimes against public administration *per* 100000 inhabitants within the period 1983-2009. Differently from these studies, Huang (2016) used a Bootstrap Panel Granger causality analysis, between 1997 and 2013, where

the measure of corruption is the Corruption Perception Index (CPI) obtaining not statistically significant estimates for all countries with exception of South Korea. Li (2016) and Lisciandra (2016) analysed only one country, respectively from 1999 until 2006 and 1968-2001. They both estimated OLS regressions but the variable used to measure corruption was different: Li (2016) used the provincial corruption rate, whereas Lisciandra (2016) usedthe number of crimes reported to prosecution departments resulting in criminal proceedings. Finally, resorting to OLS estimations Tsanana *et al* (2016) used the CPI to measure the impact of corruption on economic growth from 1995 to 2012 in enlarged EU and concluded that it has a positive impact on economic growth.

Considering the countries analysed, we can observe in the studies conducted by Huang *et al* (2016) and by Li (2016), about thirteen Asian-Pacific countries and China, respectively, the impact of corruption on economic growth was either not significant or negative. In comparison, other studies (Lisciandra, 2016; Neanidis, 2017) that investigate this impact in Italy, which is a developed country, also reach similar results by concluding that corruption affects negatively the economic growth.

Given the above synthesis, we conjecture that the impact of corruption on economic growth of emerging economies is similar to the impact on the other economies. Even though, considering the Corruption Perception Index (CPI) as an adequate variable to measure the impact of corruption on Emerging Economies and using different control variables than the ones included on these studies, we want to test whether the scenario is different between the Emerging Economies and the other counties, as the Emerging Economies are countries with higher economic growth and corruption.

H1: Corruption impacts on countries' economic growth.

H2: The impact of corruption on emerging economies' economic growth is different from the impact on remaining countries.

2.2.2. The impact of other determinants on economic growth

Technological diffusion

Technological diffusion can be considered as the increase in productivity induced from all unpaid production factors, *i.e.*, that do not result from the increase in capital intensity (Nelson and Phelps, 1966). Empirical evidence shows that technological diffusion

depends primarily on the existing gap among countries in the level of technology (Nelson and Phelps, 1966) due to the possible use of technologies developed in developed countries by developing economies (Filippetti and Payrache, 2016). This transfer of technological knowledge from developed economies to emerging economies occurs because, after using a technology for a long period of time, legal protection decreases (with the expiry of patents and copyright) and it eventually becomes obsolete in the original country (it stops increasing the productivity of the original country). Then, although it becomes useless for that original country, it is still suitable for less developed economies. In other words, the most developed countries are nearer from the technological frontier while the less developed countries are further away from it, which explains higher productivity growth rates in developing countries when compared with developed economies (Verspagen, 1991).

In the end, there will be a catching up effect, *i.e.*, the GDP *per capita* of less developed economies will converge to that of the most developed countries (Verspagen, 1991). Globalization, by enabling easier movement of people and goods, allows a faster sharing of knowledge between countries, especially between developed economies to less developed ones (Filippetti and Payrache, 2016). It is important to highlight that technological diffusion involves knowledge that already exists that flows without a registration as capital or merchandise.

Table 3 summarizes the studies that focused on the impact of technological diffusion on economic growth, considering different variables and periods of time.

Table 3: List of empiric studies about the effect of technological diffusion on economic growth

Author (Year)	Analysed Countries	Number of countries	Period	Variable to measure technological diffusion	Model	Results
Naanaa and Sellaouti (2017)	Tunisia		1970-2012	The sector of ICT (information and communication technologies) output growth in manufacturing; Percentage of employed people acquired tertiary education.	$TFPG_t = \alpha_0 + \alpha_1 FP_t + \alpha_2 Openness_t + \alpha_3 ICT_t + \alpha_4 LF_t + \epsilon_t$	significant positive effect
Jalles (2010)	World	73	1980-2005	the ratio of total number of patents to 100,000 inhabitants registered in the US market; Intellectual Property Rights Index	$y_{it} = \gamma + \sum_{t=i}^{5} \alpha_{ot} + \alpha_{1it} X_{1it} + \sum_{j=2}^{n} \alpha_j X_{2jit} + \varepsilon_{it}$	positive

Information and communication technologies at least partially explain the impact of technological diffusion on economic growth. Naanaa and Sellaouti (2017) analyzing Tunisia for the period from 1970 until 2012, found evidence that technology diffusing (proxied by the share of ICT sector) significantly and positively affected that country's economic growth. Jalles (2010) also acknowledged this positive impact on his study considering 73 economies for the period 1980-2005. He considered two proxies to measure the technological diffusion, the ratio of total number of patents to 100,000 inhabitants registered in the US market, and the Intellectual Property Rights Index.

Investment

Investment is an important determinant of economic growth (Baharumshah and Almasaied, 2009; Tsanana *et al*, 2016) – see Table 4. It encompasses both Foreign Direct Investment (FDI) and the domestic investment (Lee and Tan, 2006, Merican, 2009; Tsanana *et al*, 2016).

The FDI is not only an important channel of increasing the volume of capital in a country (as domestic investment) but also its efficiency (Li and Liu, 2005) due to the fact that it is also a knowledge diffusion path that has a great impact in other economic aspects, such as the catching-up effect (Borenszteina *et al*, 1998; Lee and Tan, 2006; Merican, 2009) and it boosts the access to advanced technologies and new markets by developing countries (Borenzteina *et al*, 1998). FDI involves a transfer of technology and knowledge, which means that it is possible to increase the capital factor, both physical and human (Borenzeina *et al*, 1998).

Being capital important in explaining productivity (Sollow, 1965), increasing the capital intensity will result in economic growth. Consequently, the higher the investment, the higher the economic growth. However, the impact of FDI is dependent on the countries' economic, institutional and technological environment (Li and Liu, 2005).

Table 4 presents some empirical evidence about the impact of investment on economic growth, showing that there is evidence of investment's positive effect on an economy (*i.e.*, countries with a higher level of investment tend to growth faster).

Table 4: List of empiric studies about the effect of investment on economic growth

Author (Year)	Analysed Countries	Number of countries	Period	Variable to measure investent	Model	Results
Tsanana *et al* (2016)	EU enlarged	27	1995-2012	Investment share (% of GDP); Foreign direct investment, net inflows (% of GDP)		Significant positive effect
Merican (2009)	ASEAN-4 nations (Malaysia, Thailand, Indonesia, Philippines)	4	Last three decades	Nominal Gross Domestic Investment in terms of % nominal GDP; Nominal FDI inflows in terms of % nominal GDP	$Y_t = \beta_0 + \beta_1 DOM_t + \beta_2 FDI_t + \beta_3 EXPT_t + \beta_4 HC_t + \varepsilon_t$	significant positive effect
Baharumshah and Almasaied (2009)	Malasya	1	1974-2004	Foreign Direct Investment	$Growth_t = \beta_0 + \beta_1 log(INT_t) + \beta_2 logFDI_t + \beta_3 CONTROLS_t + v_t$	significant positive effect
Lee and Tan (2006)	ASEAN nations (Malaysia, Thailand, Indonesia, Singapore)	4		Foreign Direct Investment inflow to host country, Domestic investment of host country	$GDP = c_1 + c_2 IMPM + d_3 FDI + d_4 DI + d_5 EXP + d_6 IMP + \varepsilon$	positive
Khan and Kumar (1997)	Developing countries	95	1970-1990			positive
Auerbach *et al* (1994)	World	61	1960-1985	The average share of real equipment investment in GDP; the corresponding share for structures investment	$DYL = c + \beta_E i_E + \beta_S i_S + \theta * GAP + \gamma * DL + \epsilon$	positive in rich countries

Tsanana *et al* (2016) uses a cross-sectional regression where the Investment share (% of GDP) and Foreign Direct Investment, net inflows (% of GDP), are the variables used to measure investment. By using this model and considering the sample mentioned before, the author concludes that investment has a significantly positive effect on economic growth. The same conclusion is taken by Merican (2009) for his study about the AESEAN-4 economies (Malaysia, Thailand, Indonesia, Philippines) for the last three decades, using autoregressive distributive lag methods. Considering Malaysia for the period 1974-2004, Baharumshah and Almasaied (2009) use FDI to measure the impact of investment on economic growth which emerged as positive and significant.

Lee and Tan's (2006), Kan and Kumar's (1997) and Auerbach *et al.'s* (1994) research goes in the same direction, but the impact is not statistically significant. Lee and Tan (2006) use Granger causality tests to measure the impact of changes in investment on economic growth of ASEAN nations (Malaysia, Thailand, Indonesia and Singapore). Using a Cobb-

Douglas production, Kan and Kumar (1997) found a positive impact of investment on the growth of 95 developing countries between 1970 and 1990. For developed countries and considering the average share of real equipment investment in GDP Auerbach *et al.* (1994) also found a positive impact.

Human Capital

Human capital results from the process of accumulation of knowledge and know-how carried out over time and it includes the formal education, training and learning by doing undertaken by individuals throughout their lives, (Becker, 1994). To measure the human capital that results inside the production process is very difficult, so, usually the full-time formal education is used as a proxy to it due to the fact that the development by the experience during the practice of a professional activity is dependent on formal education, in other words, when an individual starts a career he/she acquires knowledge faster when schooling level is high. Human capital increases the individual's productivity and, as a consequence, the economic growth. However, this relationship is not easy to measure and it depends on the ways that human beings distribute their time doing the different tasks related with their profession (Lucas, 1998).

Human capital affects economic growth, being considered a key determinant of economic growth (see, Eigbinemelon and Anaduaka, 2014; Narayan and Smyth, 2004; Lucas, 1998; Barro, 1996). It refers to the capacities of human beings, both physical and psychological, of a country; in other words, it is the combination of know-how, skills and abilities of the labor force (Eigbinemelon and Anaduaka, 2014). On the other hand, human capital development implies the increase of the number of skilled people (Eigbinemelon and Anaduaka, 2014).

Nayaran and Russel (2004) consider that one of the reasons for economic growth is the improvement on productivity reached by the increase on the educational levels of a country. Human capital development is essential for the enhancement of economic and political conditions, which is proved by the existing evidence related with the developed and newly industrializing economies (Eigbinemelon and Anaduaka, 2014)

There is substantial empirical evidence of the positive effect of human capital on economic growth – see Table 5.

Table 5: List of empirical studies about the impact of human capital on economic growth

Author (Year)	Analysed Countries	Number of countries	Period	Variable to measure investment	Model	Results
Eigbiremolen and Anaduaka (2014)	Nigeria	1	1999-2012	Product of secondary school enrollment and total labour force; government total expenditure on education	$logY = \alpha_0 + \alpha_0 logK + \beta loghL + logGTEE + W$	significant positive effect
Merican (2009)	ASEAN-4 nations (Malasya, Thailand, Indonesia, Philippines)	4	Last three decades	Adult illiteracy rate (%)	$Y_t = \beta_0 + \beta_1 DOM_t + \beta_2 FDI_t + \beta_3 EXPT_t + \beta_4 HC_t + \varepsilon_t$	significant positive effect
Narayan and Smyth (2004)	China	1	1960-1999	weighted index of educational attainment from five levels of schooling: primary, junior secondary, senior secondary, special secondary and tertiary	$\Delta lnE_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1 \Delta lnE_{t-i} + \sum_{i=0}^{n} \alpha_2 \Delta lnY_{t-i} + \sum_{i=0}^{p} \alpha_3 \Delta lnHC_{t-i} + kECM_{t-1} + \varepsilon_t$	positive
Bloom *et al* (2004)	World	1	1960-1990	Average years of schooling; Average work experience of the work force; Average square of work experience	$Y = AK^{\alpha} L^{\beta} e^{\phi_1 s + \phi_2 exp + \phi}$	significant positive effect
Wang and Yao (2003)	China	1	1952-1999	number of average effective years of schooling per person in the 14–65 age group	$Y_t = A_t K_t^{\alpha} (L_t H_t)^{\beta}$	positive
Agiomingianakis *et al* (2002)	World	93		Review of previous studies	$Y(t) = K(t)^{\alpha} H(t)^{\beta} [A(t) L(t$	positive
Barro (1996)	World	100	1960-1990	Review of previous studies		significant positive effect

The methods used and the countries analyzed are very different among studies. However, in general, the conclusions point to a positive impact of human capital oneconomic growth. Eigbiremolen and Anaduaka (2014) analyze Nigeria in the period 1999-2012 using an augmented Solow human-capital-growth model. For measuring human capital they use as a proxy the product of secondary school enrollment and total labor force and the government total expenditure on education. They conclude that human capital has a significant and positive impact on economic growth. Merican (2009) also reaches the same result for the ASEAN-4 nations (Malasya, Thailand, Indonesia and Philippines), using data from the last three decades applied in an Autoregressive Distributive Lag model. He proxied human capital using the adult illiteracy rate (%). Measuring human capital by a weighted index of educational attainment from five levels of schooling - primary, junior

secondary, senior secondary, special secondary and tertiary - Narayan and Smyth (2004) resorted to a co-integration and error-correction model for the period 1960-1999, and concluded that human capital has a positive impact on Chinese economic growth. Also for China, Wang and Yao (2003) use a simple growth-accounting framework, considering the number of average effective years of schooling per person in the 14–65 age group as a proxy of human capital, and obtain the same result - human capital has a positive impact on growth. Bloom *et al* (2004), Agiomingianakis *et al* (2002), and Barro (1996) extended the analysis for a wider group of countries, reaching a similar result.

Chapter 3. Methodology

One of the challenges of measuring the impact of corruption on economic growth lays on the fact that the (corrupt) acts are hidden in order to avoid catching the attention of the public, making difficult its analysis (Jain, 2001; Cuervo-Cazurra, 2016).

One of the possibilities of studying this phenomenon is by doing surveys. In order to do it faster and by taking advantage from new technologies, they can be answered in computers or, more recently, trough mobile apps, such as the Bribecaster, especially created for this purpose, to understand better the perceptions of society about corruption (Mittal *et al*, 2012). However, these techniques are expensive and some countries, such as the EEs, do not have a significant size that justifies the financial expenditure on this kind of studies. Thus, we opted to use data collected by well-known institutions, most notably the Transparency International which provides data for the corruption proxy (the Corruption Perceptions Index Index), and the World Bank, which provides the data for the remaining variables.

For the full database encompasses a period of 21 years (1995-2016) and 217 countries, including the 39 EEs, which means that we could potentially have 4557 observations. However, to have a more accurate model, we excluded the points with missing values and related to countries with less than 5 observations. From this, we obtained an unbalanced panel data with 1919 points for 158 countries (a panel with a density of 49,9% that represents 67,3% of world population) – see Figure 1.

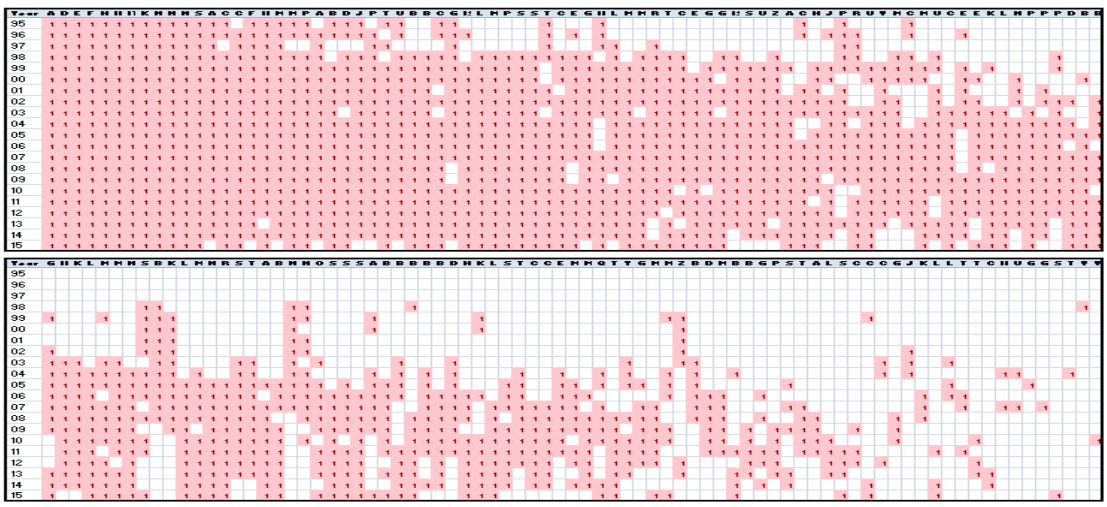

Figure 1: Sample density - countries that have, at least, CPI values in one year

The basic model chosen to study the impact of corruption on economic growth was the Solow model, which establishes a positive relationship between GNP (Y) and technological

progress (A), capital (K) and labor (L) factors, which means that an increase in each variable will induce an increase in the product (Solow, 1956).

$$Y = A\, f(K, L)$$

As mentioned before, economic growth is measured by the relative annual increase in GDPpc, which means that we need to divide both members of the equation by the population (N). By doing it, we have the equation below:

$$\frac{Y}{N} = \frac{A}{N}\, f\left(\frac{K}{N}\right) \Leftrightarrow\ GNPpc = \frac{A}{N}\, f\left(\frac{K}{N}\right)$$

The economic growth is the variation of GDPpc throughout the years and, as follows:

$$\Delta GNPpc = \ \Delta\frac{A}{N} + \ \Delta\frac{K}{N}$$

To this basic model, we add variables for the technological diffusion, measured by the proxy (GDPpc, in PPP), the physical capital variation, measured by the Liquid Capital Formation *per capita* (LCFpc), the schooling enrolment (SEPS) and, as our core, independent variable, the Corruption Perception Index (CPI), which is the perception-based measure for corruption. We also consider a first dummy (D), which assumes the value 1 when the country is an Emerging Economy (EE) and 0 otherwise, and a second multiplicative dummy (D.CPI) that measures whether the impact of corruption on economic growth of EE is different from the remaining countries. From this, we reach the following econometric specification:

$$GDPpc\ growth = \ \beta_0 + \ \beta_1 GDPpcPPP + \ \beta_2 LCFpc + \ \beta_3 SEPS + \beta_4 CPI + \ \beta_5 D + \beta_6 DCPI + \varepsilon$$

The LCFpc is measured by the difference between the Gross Capital Formation (GCF), the Consumption of Fixed Capital (CFC) and the Population Growth (PG).

$$LCFpc = GCF + CFC + PG$$

To measure the human capital we chose the school enrolment of primary and secondary (SEPS), as follows:

$$SEPS = \frac{(5SEP + 7SES)}{12}$$

We considered five years of school enrolment of primary and seven years of secondary, weighted by twelve, which is the sum of those years.

As the countries are very different in size and data available, the model will be doubly weighted: 1) by using the GDPpc, in PPP, to mitigate differences in the size of the economies; 2) to overcome the fact that the panel is unbalance, we divide the GDPpc, in PPP, by the number of points each country has in the panel, so that each point from a countries with more points is less weighted:

$$w_{(j,i)} = \frac{Population_{(j,i)} * GDPpcPPP_{(j,i)}}{Number\ of\ points\ of\ the\ country\ i}$$

We estimate two models that are W-OLS regressions.

Model 1: All countries of the sample (estimated by panel data random effects)

$$Model1 = \mathrm{lm}(GDPpcgr \sim GDPpcPPP + LCFPC + CPI + SEPS,$$
$$data = database, weight = database\$w)$$

Model 2: Emerging Economies (estimated by panel data random effects)

$$Model2 = \mathrm{lm}(GDPpcgr \sim GDPpcPPP + LCFPC + CPI + SEPS + D + DCPI,$$
$$data = database, weight = database\$w)$$

Chapter 4. Empirical results

The main aim of the present dissertation is to assess the impact of corruption on economic growth of EE, by comparison to other countries, over the period ranging from 1995 to 2015.

The econometric specifications include (see Table 6), beside the corruption proxy, other main determinants of economic growth, namely technological diffusion, physical investment, human capital, and two dummies that permit to highlight the eventual distinct impact of corruption on the economic growth of EEs compared to that impact on other countries.

Table 6: Random effect panel estimation (dependent variable: growth in GDP pc), 1995-2015

Independent variable	Description	Model 1 RE	Model 2 RE
CPI	'Corruption Perception Index' (the higher the CPI, the higher the level of transparency, the lower the corruption)	0.038*** (6.79)	+0.032*** (5.36)
GDPpc PPP	Gross Domestic Product per capita (in PPP)	-0.052*** (-7.72)	-0.029 (-4.17)
LCFPC	Liquid Capital Formation *per capita* (% of GDP)	+0.257*** (26.16)	+0.203*** (17.79)
SEPS	Schooling enrolment, primary and secondary	-0.025*** (-3.63)	-0.013 (-1.95)
D	Dummy (1 if the country is an EE and 0 if not)		+2.371*** (3.76)
DCPI	Dummy of the multiplicative D*CPI		-0.001 (-0.55)
Constant		+1.805** (2.96)	+0.422 (0.65)
Multiple R^2		0.42	0.44

*Significant at 0.1% level; **Significant at 1% level; ***Significant at 5% level

Globally the variables included in the models explain about 43% (42% for the model 1 and 44% for Model 2) of the variance of the GDPpc growth variable that is good in a panel data estimation.

Estimates obtained (either in Model 1 or Model 2) suggest that, all the remaining factors being held constant, countries with lower level of percept corruption (i.e., higher CPI, more transparent), have a higher economic growth. Thus, our main hypothesis (H1) is validated, confirming our conjecture about the negative impact of corruption on economic

growth of countries. It is therefore in accordance with several studies (see Li, 2016; Lisciandra, 2016; Chang and Hao, 2017; Neanidis *et al*, 2017) and consequently with the "sand in the wheels" theory.

Emerging economies are associated with higher economic growth rates when compared with developed economies, so we conjectured that the impact of corruption on economic growth would differs between the EEs and the rest of the countries. However, analyzing the results our conjecture is not in accordance with the data: We observe that the impact of corruption on economic growth of EEs is similar to the impact verified on the other economies, which means that the H2 hypothesis is not confirmed. In other words, independently of the rate of economic growth of economies, the higher the level of corruption, the lower the economic rate of growth.

In accordance with existing literature, we observe that the countries with higher GDPpcPPP have a lower growth. This happens, we conjecture, due to technological diffusion. It is also in accordance with literature the result that countries with higher liquid investment rate have higher economic growth rate. There was an unexpected result related with school enrolment: Contrary to literature, we observe that countries with higher school enrollment have a lower economic growth.

Conclusion

On the last decades, several scholars have studied corruption and its implications in the most diverse fields, namely, its impact on economic growth. Even though there have been done significant progresses, there is still no agreement whether the impact of corruption on economic growth is positive, negatively or non-significant. We can state that both perspectives of the impact of corruption on economic growth, the "grease the wheels" theory and the "sand in the wheels", have receive some empirical support (Cuervo-Cazurra, 2008).

Extant empirical studies have focused on different countries or group of countries but did not pay attention to the whole group of the so-called Emerging Economies (39 countries, according to Saccone, 2017), which represent almost 60% of the global population. In concrete, the few empirical studies that focused on EEs consider either one or a small set of EEs or encompass micro level analysis (banks, firms …) rather than macro/economic growth analyses.

Aiming at overcoming this literature gap, the main goal of the present dissertation was to assess the impact of corruption on economic growth of Emerging Economies, comparing it to that of the remaining countries. Given the characteristics of EEs, which are economies with low income but that are growing in economic terms at a fast pace, converging to the more developed countries, it could expected that corruption would have a different impact on economic growth, comparing with the remaining countries.

To pursue this goal, we used an unbalanced panel data from the World Bank and the Transparency International, covering the period from 1995 to 2015.

The results achieved are in accordance with the majority of the studies done about the impact of corruption on economic growth of emerging economies, which conclude it has a negative impact, *i. e.*, the higher the level of corruption, the lower the economic growth. Even though some studies find evidence of its positive impact, the "sand in the wheels" theory prevails. We could also conclude that this impact on EEs is not different from the impact on the other countries of the world. The model 2, which allows that comparison by including the multiplicative dummy DCPI, confirms that the impact of corruption on EEs is not significantly distinct from the impact on the other countries.

One of the limitations of the present investigation is related with the fact that the variable used to measure corruption, the CPI, is based on perceptions which might not reflect a real

image of what corruption is and its impact on economic growth, as it depends on people's opinions that can be different from country to country. On our models we are also not considering the possible causality between corruption and the control variables (technological diffusion, human capital and investment), which mean that we are neglecting nonlinearities of corruption on economic growth.

Other limitation is related with the fact that our result about the impact of human capital on economic growth is contrary to existing literature, it deserves further study to identify the causes of this disagreement. However, due to the fact that the aim of our study is just to measure the impact of corruption on growth and this variable is used just as control variable in order not to compromise the centricity of the estimator of the impact of corruption on growth, it is a study that is not central to the present dissertation. We conjecture that this result could be due to the endogeneity of the variables "Scholl enrollment", which is a proxy for measure human capital and it is not probably the most adequate.

Finally, it is expected that the present dissertation contributes to the existing literature by providing not only a global acknowledgement about what corruption is and its implications at an economical level but also to enlarge the range of countries studied in what respects to the topic of the impact of corruption on economic growth.

References

Agiomirgianakis, G., Asteriou, D. and Monastiriotis, V. (2002), "Human Capital and Economic Growth Revisited: A Dynamic Panel Data Study", *International Advances in Economic Research*, Vol. 8, N. 3, pp. 177-187

Auerbach, A. J., Hasset, K. A. and Oliner, S. D. (1994), "Reassessing the social returns to equipment investment", *Quarterly Journal of Economics*, Vol. 109, N. 3, pp. 789-802

Bagashka, T. (2014), "Unpacking corruption: The effect of veto players on state capture and bureaucratic corruption", *Political Research Quarterly*, Vol. 67, Nº 1, pp. 165-180.

Baharumshah, A. Z. and Almasaied, S. W. (2009), "Foreign direct investment and economic growth in Malaysia: Interactions with human capital and financial deepening", *Emerging Markets Finance and Trade*, Vol. 45, N. 1, pp. 90-102

Bardhan, P. (1997), "Corruption and Development: A Review of Issues", *Journal of Economic Literature*, Vol. 35, N. 3, pp. 1320-1346

Barro, R. J. (1996), "Determinants of economic growth: A cross-country empirical study", *NBER Working Paper Series 5698*

Becker,

Birhanu, A. G., Gambardella, A., Valentini, G. (2016), "Bribery and investment: Firm-level evidence from Africa and Latin America", *Strategic Management Journal*, Vol. 37, N. 9, pp. 1865-1877

Bloom, D. E., Canning, D. and Sevilla, J. (2004), "The effect of health on economic growth: A production function approach", *World Development*, Vol. 32, N. 1, pp. 1-13

Borensztein, E., De Gregorio, J. and Lee, J-W. (1998), "How does foreign investment affect economic growth?", *Journal of International Economics*, Vol 45, N. 1, pp. 115-135

Bosco, B. (2016), "Old and new factors affecting corruption in Europe: Evidence from panel data", *Economic Analysis and Policy*, Vol. 51, pp. 68-85.

Buzogány, A. and Häsing, J. (2017), "Spokes in the wheel. European affairs and the parliamentary administration of German Landtage", *The Journal of Legislative Studies*, Vol. 23, Nº 2, pp. 200-220.

Chang, C.-P. and Hao, Y. (2017), "Environmental performance, corruption and economic growth: global evidence using a new data set", *Applied Economics*, Vol. 49, N. 5, pp. 498-514

Chen, M., Jeon, B. N., Wang, R. and Wu, J. (2015), "Corruption and bank risk-taking: Evidence from emerging economies", *Emerging Market Review*, Vol. 24, pp. 122-148

Cuervo-Cazurra, A. (2008), "Better the devil you don't know: Types of corruption and FDI in transition economies", *Journal of International Management*, Vol. 14, N. 1, pp. 12-27

Cuervo-Cazurra, A. (2016), "Corruption in international business", *Journal of World Business*, Vol. 51, Nº 1, pp. 35-49

Eigbiremolen, G. O. and Anaduaka, U. S. (2014), "Human Capital Development and Economic Growth: The Nigeria Experience", *International Journal of Academic Research in Business and Social Sciences*, Vol. 4, N. 4, pp. 25-35

Filippetti, A. and Peyrache, A. (2016), "Productivity growth and catching-up: A technology gap explanation", *International Review of Applied Economics*, Vol. 31, Nº 3, pp. 283-303

Grande, M. and Teixeira, A. A. C. (2012), "Corruption and multinational companies' entry modes – Do linguistic and historical ties matter?", *South African Journal of Economic and Management Sciences"*, Vol. 15, N. 3, pp. 269-281

Gutmann, J. and Lucas, V. (2017), "Private-sector corruption: Measurement and cultural origins", *Social Indicators Research*, pp. 1-24.

Hoskisson, R. E., Eden, L., Lau, C. M., Wright, M. (2017), "Strategy in Emerging Economies", *Academy of Management Journal*, Vol. 43, Nº 3, pp. 249-267

Huang, C. (2016), "Is corruption bad for economic growth? Evidence from Asian-Pacific countries", *North American Journal of Economics and Finance*,Vol. 35, pp. 247-256.

Jain, A. (2001), "Corruption: A review", *Journal of Economic Surveys*, Vol. 15, Nº1, pp. 71-116.

Jalles, J. T. (2010), "How to measure innovation? New evidence of the technology-growth linkage", *Research in Economics*, Vol. 64, pp. 81-96

Karhunen, P. and Ledyaeva, S. (2012), "Corruption Distance, Anti-corruption Laws and International Ownership Strategies in Russia", *Journal of International Management*, Vol. 18, N. 2, pp. 196-208

Khan, M. S. and Kumar, M. S. (1997), "Public and private investment and the growth process in developing countries", *Oxford Bulletin of Economics and Statistics*, Vol. 59, N. 1, pp. 84-86

Kong, D.T. and Volkema, R. (2016), "Cultural endorsement of broad leadership prototypes and wealth as predictors of corruption", *Social Indicators Research*, Vol. 127, pp. 139-152.

Lee, H. H. and Tan, H. B. (2006), "Technology transfer, FDI and economic growth in the ASEAN region", *Journal of the Asian Pacific Economy*, Vol. 11, N. 4, pp. 394-410

Leys, C. (1965), "What is the Problem about Corruption?", *The Journal of Modern African Studies*, Vol. 3, Nº 2, pp. 215-230

Li, X. (2016), "Measuring local corruption in China: Acautionary tale", *Journal of Chinese Political Science*, Vol.21, pp. 21-38.

Li, X. and Liu, X. (2005), "Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship", *World Development*, Vol. 33, Nº 3, pp. 393-407

Lisciandra, M. and Millemaci, E. (2017), "The economic effect of corruption in Italy: a regional panel analysis", *Regional Studies*, Vol. 51, pp. 1387-1398.

Lo, S.S. (2017), "Comparative grand corruption and protection pacts among elites: The case of Ao Man Long in Macao and Hui Si-Yan in Hong Kong", *Asian Journal of Political Science*, Vol. 25, N. 2, pp. 234-251.

Luo, Y. and Han, B. (2009), "Graft and business in emerging economies: An ecological perspective", *Journal of World Business*, Vol. 44, N. 3, pp. 225-237

Lucas, R. E. (1998), "On the mechanics of economic development", *Journal of Monetary Economics*, Vol. 22, Nº 1, pp. 3-42

Marthur, A., Singh, K. (2013), "Foreign direct investment", *Applied Economics*, Vol. 45, N. 8, pp. 991-1002

Mauro, P. (1995). "Corruption and growth", *The Quarterly Journal of Economics*, 110, 681–712.

Méon, P.G. and Sekkat, K. (2005), "Does corruption grease or sand the wheels of growth?", *Public Choice*, Vol. 122, Nº 1, pp. 69-97

Merican, Y. (2009), "Foreign Direct Investment and Growth in ASEAN-4 Nations", *International Journal of Business and Management*, Vol. 4, N.5, pp. 46-62

Mittal, M., Wu, W., Rubin, S., Madden, S. and Hartmann, B. (2012), "Bribecaster: Documenting bribes trough community participation", *Proceedings of the ACM Conference on Computer Supported Cooperative Work*, *CSCW*, pp. 171-174

Mo, P. H. (2001), "Corruption and Economic Growth", *Journal of Comparative Economics*, Vol. 29, pp. 66-79

Moghadam, M. R., Samavati, H. and Dilts, D. A. (2003), "An examination of capital flight from East Asian emerging economies: Paradise lost", *Journal of Asia-Pacific Business*, Vol. 5, N. 1, pp. 33-49

Naanaa, I. D. and Sellaouti, F. (2017), "Technological Diffusion and Growth: Case of the Tunisian Manufacturing Sector", *Journal of the Knowledge of the Economy*, Vol. 8, N.1, pp. 369-383

Narayan, P. K. and Smyth, R. (2004), "Temporal Causality and the Dynamics of Exports, Human Capital and Real Income in China", *International Journal of Applied Economics*, Vol. 1, N. 1, pp. 24-45

Neanidis, K. C., Rana, M. P., Blackburn, K. (2017), "An empirical analysis of organized crime, corruption and economic growth", *Annals of Finance*, Vol. 13, N. 3, pp. 273-298

Nelson, R. R. and Phelps, E. S. (1966), "Investment in Humans, Technological Diffusion and Economic Growth", *The American Economic Review*, Vol. 56, N. 1/2, pp. 69-75

Oxford Advanced Learner's Dictionary, Oxford University Press, 8th Edition 2010, pp.196

Paul, B. P. (2010). "Does corruption foster growth in Bangladesh?", *International Journal of Development*, Vol. 9, N. 3, 246–262.

Payne, G. T., Moore, C. B., Bell, R. G. and Zachary, M. A. (2013), "Signaling organizational virtue: An examination of virtue rhetoric, country-level corruption, and performance of foreign IPO's from emerging and developed economies", *Strategic Entrepreneurship Journal*, Vol. 7, N. 3, pp. 230-251

Pelizzo, R., Barris, O. and Janenova, S. (2017), "Objective or perception-based: A debate of ideal measure of corruption", *Cornel International Law Journal*, Vol. 50, pp. 77-106.

Rose-Akerman, S, 1997, The political Economy of Corruption, In Elliott, K. A., 1997, *Corporation and the global economy*, Washington DC: Institute for International Economics, 31-60.

Saconne, D. (2017), "Economic growth in emerging economies: what, who and why", *Applied Economics Letters*, Vol. 24, N.11, pp. 800-803

Solow, R. M. (1956), "A contribution to the theory of economic growth", *Quarterly Journal of Economics*, Vol. 70, N. 1, pp.65-94

Trung, N. B. and Kaizoji, T. (2017), "Investment climate and firm productivity: An application to Vietnamese manufacturing firms", *Journal of Applied Economics*, Vol. 49, N. 44, pp. 4394-4409

Tsanana, E., Chapsa, X. and Katrakilidis, C. (2016), "Is growth corrupted and or bureaucratic? Panel evidence from the enlarged EU", *Applied Economics*, Vol. 48, N.33, pp. 3131-3147

Uhlenbruck, K., Rodriguez, P., Doh, J. and Eden, L. (2006), "The impact of corruption on entry strategy: Evidence from telecommunication projects in emerging economies", *Organization Science*, Vol. 17, N. 3, pp. 402-414

Verspagen, B. (1991), "A New Empirical Approach to Catching Up or Falling Behind", *Structural Change and Economic Dynamics*, Vol. 2, N. 2, pp. 359-380

Wang, L. and Murnighan, J. K. (2016), "Two-rather than one-way streets: Agents as casual forces in principals' unethical decisions", *Journal of Economic Behaviour &Organization*, Vol. 132, pp. 217-227.

Wang, Y and Yao, Y. (2003), "Sources of China's economic growth 1952-1999: incorporating human capital accumulation", *China Economic Review*, Vol. 14, N. 1, pp. 32-52

Williams, A. and Dupuy, K. (2017), "Deciding over nature: Corruption and environmental impact assessments", *Environmental Impact Assessment Review*, Vol. 65, pp. 118-124.

Williams, C. C. and Perez, A. M. (2016), "Evaluating the impacts of corruption on firm performance in developing economies: An institutional perspective", *International Journal of Business and Globalization*, Vol. 16, N. 4, pp. 401-422

Wu, J. (2014), "The antecedents of corporate social and environmental irresponsibility", *Corporate Social Responsibility and Environmental Management*, Vol. 21, N. 5, pp. 286-300.